(yellow pigments of the cell sap) than are plants grown on the plains. They believe that these pigments protect the mountain plants against the high insolation (especially actinic rays) of their habitat. Contrary to KERNER, they believe that anthocyanin in the foliage of mountain plants has little protective significance against light, for it develops mainly in the autumn after the light intensity has fallen. They consider the anthocyanin in foliage organs as originating by the reduction of the flavone bodies and thereby offering a problem in cell physiology, rather than being of physiological significance. They do not deny that anthocyanins of the brilliantly colored mountain flowers are of significance as light screens. They also emphasize the protective function of flavone bodies in the white and yellow flowers. The mountain plants show a great reduction in flavone content when they are grown on the plains. For a general statement of the chemical side of this problem the reader is referred to a recent review upon anthocyanins.[16]—WILLIAM CROCKER.

Morphology of Isoetes japonica.—WEST and TAKEDA[17] have investigated this species, rather widely distributed in Japan, and the largest species of the genus known, the stem ("caudex" of the authors) of an old plant often attaining 4 cm. in diameter, and in very large specimens a diameter of 8 cm. may be reached. The trilobed caudex consists of two distinct structures, stem and rhizophore, to which the leaves and roots are attached respectively, but on account of the stunted growth all external morphological differentiation between the two organs is lost. The stem apex is a conical mass of tissue at the base of the funnel-shaped depression in the cortex, and in this protuberance no apical cell can be distinguished. The primary vascular axis is "a non-medullated monostele," and no secondary xylem is formed in this species. The rhizophore, a distinct root-bearing organ, is regarded in *Isoetes* "as an organ *sui generis*." The anatomy of stem, rhizophore, and leaf is described in detail. The authors conclude that *Isoetes* "occupies an isolated position amongst recent vascular cryptogams, and is regarded as the sole living representative of the class Isoetales."—J. M. C.

Permeability.—FITTING[18] finds the plasmolytic method rather serviceable for studying the intake of salts by the cells of various plants, especially *Rhoeo discolor*, which was used mainly in the investigation. Permeability to salts of alkali metals (K, Na, and Li) is rather great. It varies with the leaf and is greatest in summer and very slight in winter. The permeability for sodium and potassium salts was about equal and for the lithium salts considerably lower. The permeability was largely determined by the anion, the sulphate

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[16] BOT GAZ. **61**:349–352. 1916.

[17] WEST, CYRIL, and TAKEDA, H., On *Isoetes japonica* A.Br. Trans. Linn. Soc. London **8**:333–376. *pls. 23–40. figs. 20.* 1915.

[18] FITTING, HANS, Untersuchungen über die Aufnahme von Salzen in lebende Zelle. Jahrb. Wiss. Bot. **56**: 1–64. 1915.

entering less readily than the nitrate or the chloride. It is of great interest that a considerable sojourn in a hypotonic solution lowered the permeability of the cell to the salt and apparently to the water. FITTING says that this is not a toxic effect. The method shows no evidence that the salts of metals of alkaline earths (Mg, Ca, Ba, and Sr) enter the cells, so equilibrium between the inside and outside need not be reached even in a solution of an essential salt. One wonders whether the permeability in a plasmolytic concentration throws much light on permeability in natural conditions.—WILLIAM CROCKER.

Morphology of Peranema.—DAVIE[19] has investigated the development of the sorus, sporangium, and gametophyte of this Indian fern. The study was suggested by the possible intermediate character of the genus between Cyatheaceae and Polypodiaceae. The receptacle is of the Gradatae type, but the mature sorus is a mixed one. The sporangium also in its early segmentation sometimes follows the type of one family, and sometimes that of the other family. In comparing the features of the genus, the conclusion is reached that an intermediate series consisting of *Woodsia*, *Diacalpe*, and *Peranema* is probable, *Woodsia* coming nearest Cyatheaceae, and *Peranema* nearest Polypodiaceae. The mature sorus of *Peranema* is thought to be most related to that of *Nephrodium*, and a phyletic line is traced from the Cyatheaceae to the Aspidieae group of the Polypodiaceae.—J. M. C.

Two new terms.—TRELEASE[20] has proposed two new botanical terms to be applied to hitherto nameless morphological conditions. He points out that the old grouping of plants into thallophytes and cormophytes fails to include such plants as mosses, which are not cormophytes because, although "stem-like," they do not develop root and shoot. He proposes, therefore, a grouping of plants into 3 categories: thallophytes, "cormophytasters" (or pseudo-cormophytes), and cormophytes. The second term, "xeniophyte," is proposed for the so-called endosperm of angiosperms, which being neither an x nor a $2x$ generation is a third generation which has been "overlooked." The angiosperms, therefore, in addition to their other peculiar features, are unique in having 3 generations: sporophyte, gametophyte, and xeniophyte.—J. M. C.

Seed germination in Megarrhiza.—HILL[21] has investigated the peculiar seed germination of several species of this genus, which is also known as *Marah*. The petioles of the cotyledons are "fused together" to form a tube, which

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[19] DAVIE, R. C., The development of the sorus and sporangium and the prothallus of *Peranema cycathoides* D. Don. Ann. Botany **30**:101–110. *pl. 3. figs. 2.* 1916.

[20] TRELEASE, WILLIAM, Two new terms, cormophytaster and xeniophyte, axiomatically fundamental in botany. Proc. Amer. Phil. Soc. **55**:237–242. 1916.

[21] HILL, A. W., Studies in seed germination. The genus *Marah* (*Megarrhiza*), Cucurbitaceae. Ann. Botany **30**:215–222. *pl. 5. figs. 2.* 1916.